

A New Species of *Fissidens* (Bryopsida, Fissidentaceae) from Peninsular Malaysia

Z. IWATSUKI¹, K.-T. YONG² AND
T. SUZUKI³

¹The Hattori Botanical Laboratory, Okazaki Branch, 10-3 Mutsuna-shin-machi,
Okazaki-shi, Aichi-ken 444-0846, Japan

²Institute of Biological Sciences, Faculty of Science, University of Malaya, 50603
Kuala Lumpur, Malaysia

³The Hattori Botanical Laboratory, Shimada Branch, 6480-3 Takasago-cho,
Shimada-shi, Shizuoka-ken 427-0054, Japan

Abstract

A new moss species collected from Peninsular Malaysia, *Fissidens benitotanii* Z.Iwats., K.-T.Yong & Tad.Suzuki is described. The species belongs to subgenus *Fissidens* section *Fissidens*. Most of the members in sect. *Fissidens* have smooth laminal cells, except for a few species, which included this newly described species, possess unipapillose laminal cells. *Fissidens benitotanii* is easily distinguished from other *Fissidens* species in the region by the following characteristics: narrowly lanceolate leaves with shortly excurrent costa, thin limbidia that disappear near leaf apex, and unipapillose laminal cells with distinctive sharp papilla.

Introduction

Iwatsuki and Mohamed (1987) reported 24 species of *Fissidens* for Peninsular Malaysia and Singapore in a revision of the genus. Recently, we discovered an interesting species while studying some of the *Fissidens* specimens collected by one of the co-authors, K.-T. Yong from Peninsular Malaysia. After studying the specimens carefully, and comparing them with related known species, we reached the conclusion that one of the specimens represents a new species belonging to subgen. *Fissidens* sect. *Fissidens*. However, this plant specimen in question is different from the typical members of sect. *Fissidens* in having distinctly unipapillose laminal cells.

Fissidens benitotanii Z.Iwats., K.T.Yong & Tad.Suzuki, sp. nov.
Sterilis. *Caulis* 4.5-5.0 mm longus, cum foliis 2.0-2.5 mm latus. *Folia* 9-13 juga, anguste lanceolata, 1.3-1.7 mm longa, 0.25-0.35 mm lata; apice acuto; costa excurrenta; cellulae laminarum unipapillosa; marginibus limbatus.

– **Holotypus:** Peninsular Malaysia, State of Perak, Belum Royal Park, Upper Belum Region, upstream of Kenarong River, lowland forest, alt. 200-300 m, on soil, 30 Jul 2003, coll. K.-T. Yong 4660 (KLU; isotype in NICH, SING). **Figs. 1, 2.**

Medium-sized plant for the genus. **Stems** simple, 4.5-5.0 mm long, 2.0-2.5 mm wide with leaves; axillary hyaline nodules not differentiated; in cross-section cortical cells small and thick-walled, central strand weakly differentiated. **Leaves** 9-13 pairs, more or less densely arranged; middle to upper leaves narrowly lanceolate, 1.3-1.7 mm long, 0.25-0.30 mm wide, narrowly acute at apex; base of dorsal lamina rounded, not decurrent; costa stout, shortly excurrent; margin almost entire, but finely crenulate by projection of cells near apex; vaginant lamina about 1/2 of the leaf length. Limbidia usually 1-2 rows of elongate cells near apical laminae, 3-4 rows of cells on vaginant laminae; in cross-section 1-2 cells thick; lacking near leaf apices. Laminae in cross-section 1 cell thick; cells of apical lamina quadrate to hexagonal, 8-12 μ m long, moderately thick-walled, sharply unipapillose; cells of vaginant laminae similar to those of apical laminae, but larger and longer toward base. **Dioicous?**; male plants and **sporophytes** not found.

The species name, *Fissidens benitotanii*, is dedicated to Dr. Benito C. Tan, an active bryologist in Asia who has spent many years studying the tropical Asiatic bryophytes, particularly the moss species, and have contributed many important papers to the study of Asiatic moss flora. In addition, the honoree, B.C. Tan, is a mentor of K-T. Yong, one of the co-authors of this paper, in his study of the moss flora of Malaysia.

The new species, *Fissidens benitotanii*, is placed within subgenus *Fissidens* sect. *Fissidens* (cf. Suzuki and Iwatsuki, 2007) that is characterized by the presence of limbidia on the apical, dorsal and vaginant laminae. By and large, the species in sect. *Fissidens* are known to have smooth laminal cells, but there are exceptional cases where a small number of them have papillose laminal cells. Those species with unipapillose laminal cells are thus far only been reported from the tropical areas; for example, *Fissidens angustifolius* Sull. (syn. *F. dixonianus* E.B. Bartram) is found in Fiji Islands, Central and South America (cf. Iwatsuki and Suzuki, 1996; Pursell, 2007), and *F. raياتensis* E.B. Bartram (cf. Whittier and Miller, 1967) from Society Islands.

The new species, *F. benitotanii*, can be distinguished from *F. angustifolius* and *F. raياتensis* by its limbidia disappearing at the leaf apex, its narrowly lanceolate leaves with acute apices, and the shortly excurrent costa (Fig. 1g), whereas *F. angustifolius* has percurrent costa, and limbidia always reaching the leaf tips. Also, papilla on the laminal cell of *F. benitotanii* is much sharper comparing with that of *F. angustifolius*. Hyaline nodules are

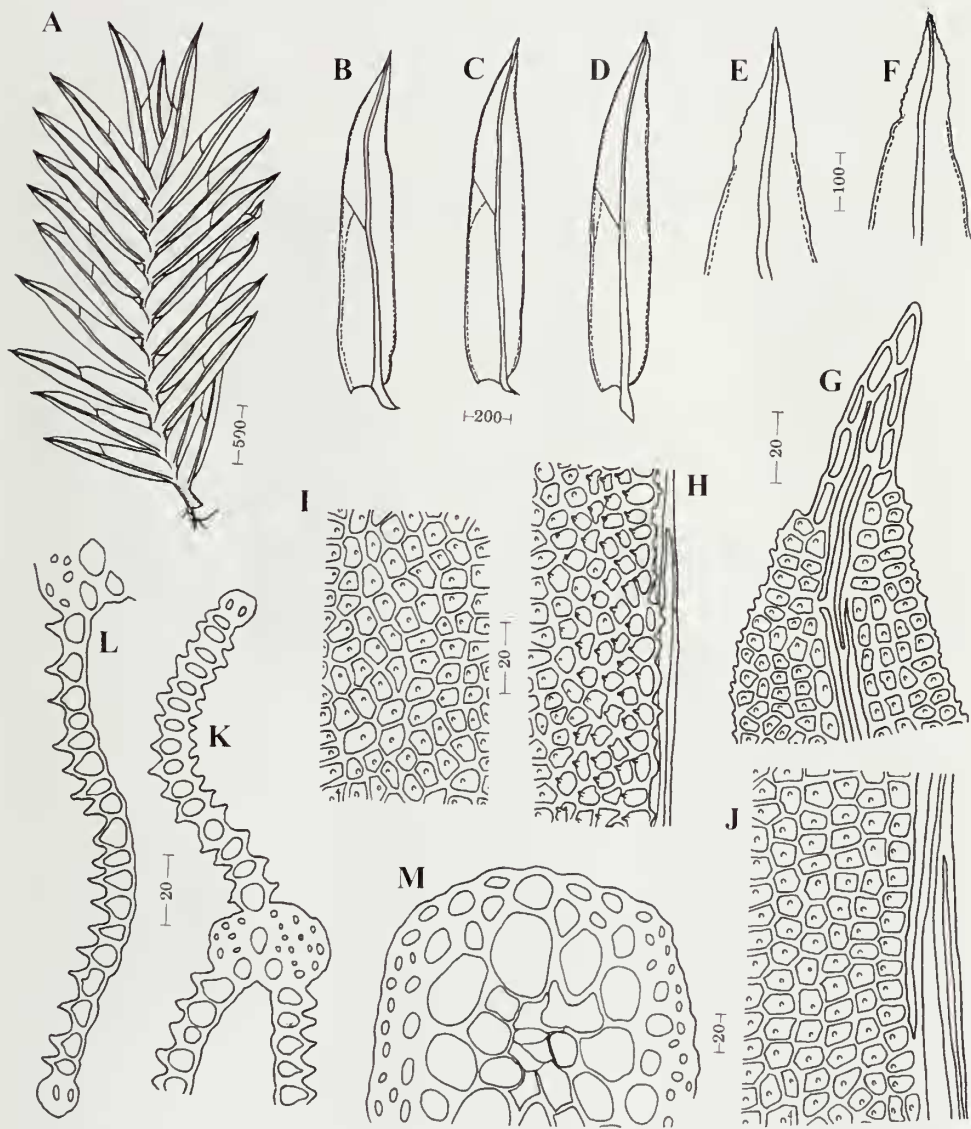


Figure 1. *Fissidens benitotanii* Z.Iwats., K.-T.Yong & Tad.Suzuki. A. Plant. B-D. Leaves. E-F. Leaf apices; G. Cells at leaf apex; H. Marginal cells of apical lamina; I. Cells of apical lamina. J. Cells at margin of vaginant lamina; K-L. Cross-sections of leaf; M. Cross-section of stem. All figures drawn from the isotype specimen (K.-T. Yong 4660 in NICHI). Scale bars in µm.

present on the stems of *F. angustifolius*, but are absent in *F. benitotanii*.

The type material for *F. benitotanii* is sterile, with no sporophytic structure. We made a few attempts to search for the archegonia and antheidia of this species, but were not successful. Sexuality of this species is probably dioicous.

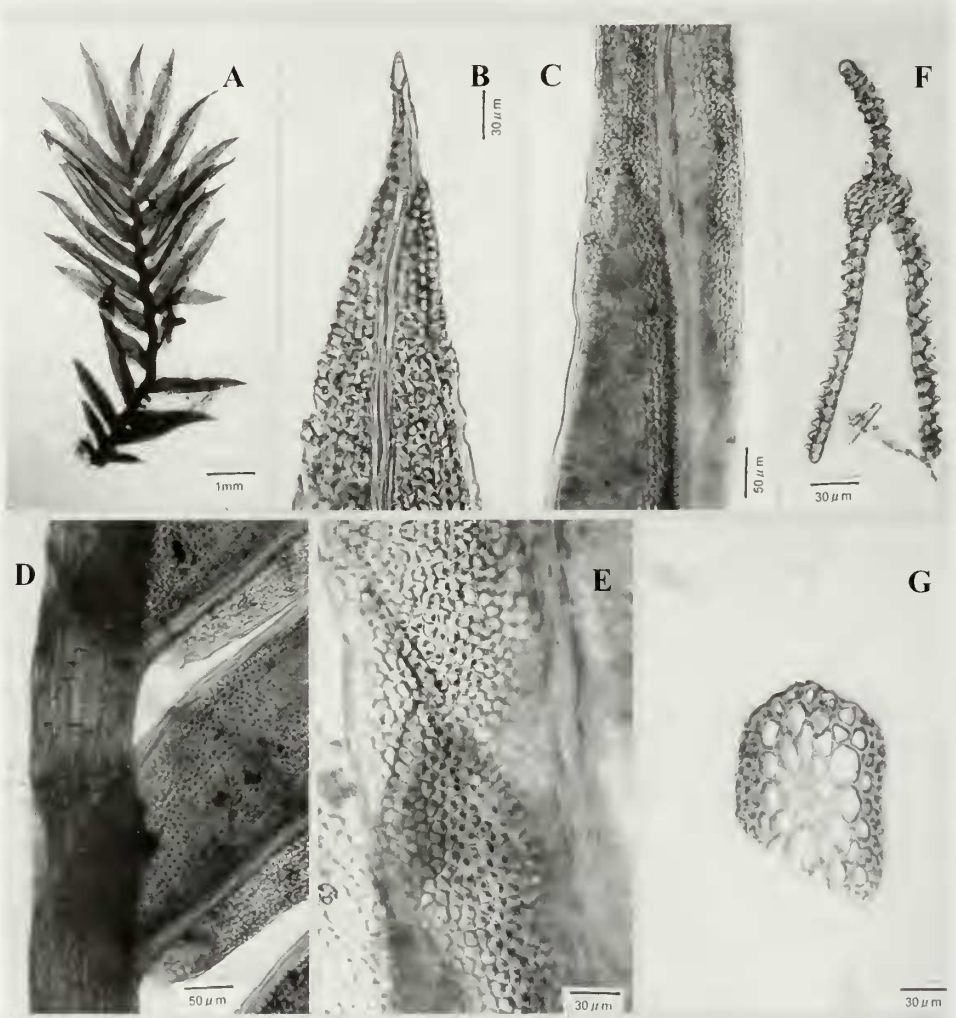


Figure 2. *Fissidens benitotanii* Z.Iwats., K.-T.Yong & Tad.Suzuki. A. Plant; B. Leaf apex; C. Median part of leaf; D. Basal part of leaf; E. Papillose cells at middle of leaf; F. Cross-section of leaf; G. Cross-section of stem; All figures were from the isotype specimen (K.-T. Yong 4660 in NICH).

Acknowledgements

Grateful acknowledgement is made to the Japan Society for the Promotion of Science for financial support made available through a Grant in Aid for Scientific Research © (no. 19570098) and a research grant provided by University of Malaya, Malaysia. The authors also like to express their appreciation to Madam Patricia Loh who helps us to improve the English text.

References

- Iwatsuki, Z. and M.A. Haji Mohamed, 1987. The genus *Fissidens* in Peninsular Malaysia and Singapore (a preliminary study). *Journal of Hattori Botanical Laboratory* **62**: 339-360.
- Iwatsuki, Z. and T. Suzuki, 1996. *Fissidens* in the Fiji Islands. *Journal of Hattori Botanical Laboratory* **79**: 139-162.
- Pursell, R., 2007. Fissidentaceae, 278 pp. In: *Flora Neotropica Monograph 101*. New York Botanical Garden Press, New York.
- Suzuki, T. and Z. Iwatsuki, 2007. A new approach to the infrageneric classification of the genus *Fissidens* (Fissidentaceae, Bryopsida). *Hikobia* **15**: 67-85.
- Whittier, H.O. and H.A. Miller, 1967. Mosses of the Society Islands: *Fissidens*. *Bryologist* **70**(1): 76-93.

